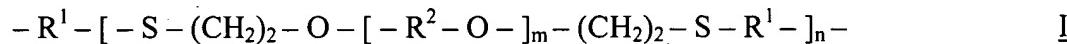


### Amendments to the Claims

1. (currently amended) A polythioether comprising a structure having the formula I



wherein

$\text{R}^1$  denotes a divalent  $\text{C}_{2-6}$  n-alkylene,  $\text{C}_{3-6}$  branched alkylene,  $\text{C}_{6-8}$  cycloalkylene or  $\text{C}_{6-10}$  alkylcycloalkylene group,  $-[(\text{CH}_2)_p - \text{X} -]_q - (\text{CH}_2)_r -$ , or  $-[(\text{CH}_2)_p - \text{X} -]_q - (\text{CH}_2)_r -$  in which at least one  $-\text{CH}_2-$  unit is substituted with a methyl group,

$\text{R}^2$  denotes methylene, a divalent  $\text{C}_{2-6}$  n-alkylene,  $\text{C}_{2-6}$  branched alkylene,  $\text{C}_{6-8}$  cycloalkylene or  $\text{C}_{6-10}$  alkylcycloalkylene group,  $-[(\text{CH}_2)_p - \text{X} -]_q - (\text{CH}_2)_r -$ , or  $-[(\text{CH}_2)_p - \text{X} -]_q - (\text{CH}_2)_r -$  in which at least one  $-\text{CH}_2-$  unit is substituted with a methyl group,

$\text{X}$  denotes one selected from the group consisting of O, S and  $-\text{NR}^6-$ ,

$\text{R}^6$  denotes H or methyl,

$m$  is a rational number from 0 to 10,

$n$  is an integer from 1 to 60,

$p$  is an integer from 2 to 6,

$q$  is an integer from 1 to 5, and

$r$  is an integer from 2 to 10,

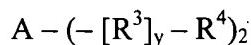
said polythioether being a liquid at room temperature and pressure.

2. (original) The polythioether of claim 1 which has a glass transition temperature  $T_g$  not higher than  $-50^\circ\text{C}$ .

3. (original) The polythioether of claim 1 which, when cured, has a % volume swell not greater than 25% after immersion for one week in JRF type 1 at 60°C and ambient pressure.

4. (currently amended) The polythioether of claim 1 which has a number average molecular weight between about 500 and 20,000 Daltons.

5. (currently amended) The polythioether of claim 1 having the formula II



II

wherein

A denotes a structure having the formula I,

y is 0 or 1,

$R^3$  denotes a single bond when y=0 and  $-S-(CH_2)_2-[-O-R^2]_m-O-$  when y=1,

$R^4$  denotes  $-SH$  or  $-S-(CH_2)_2-O-R^5$  when y=0 and  $[-CH_2=CH_2]$   $-CH=CH_2$  or  $-(CH_2)_2-S-R^5$  when y=1,

$R^5$  denotes  $C_{1-6}$  n-alkyl which is unsubstituted or substituted with at least one  $-OH$  or  $NHR^7$  group, and

$R^7$  denotes H or a  $C_{1-6}$  n-alkyl group.

6. (original) The polythioether of claim 5 wherein y=0.

7. (original) The polythioether of claim 6 wherein  $R^4$  is  $-SH$ .

8. (currently amended) The polythioether of claim 7 wherein (i) when m=1 and R<sup>2</sup>=n-butylene, R<sup>3</sup> is not ethylene or n-propylene, and (ii) when m=1, p=2, q=2, r=2, and R<sup>2</sup>=ethylene, X is not O.

9. (original) The polythioether of claim 6 wherein R<sup>4</sup> is -S-(CH<sub>2</sub>)<sub>2</sub>-O-R<sup>5</sup>.

10. (original) The polythioether of claim 9 wherein R<sup>5</sup> is n-C<sub>2</sub>H<sub>5</sub>, n-C<sub>4</sub>H<sub>9</sub>-OH or n-C<sub>3</sub>H<sub>7</sub>-NH<sub>2</sub>.

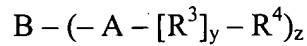
11. (original) The polythioether of claim 5 wherein y=1.

12. (original) The polythioether of claim 11 wherein R<sup>4</sup> is -CH=CH<sub>2</sub>.

13. (original) The polythioether of claim 11 wherein R<sup>4</sup> is -(CH<sub>2</sub>)<sub>2</sub>-S-R<sup>5</sup>.

14. (original) The polythioether of claim 13 wherein R<sup>5</sup> is n-C<sub>3</sub>H<sub>7</sub>-OH.

15. (currently amended) The polythioether of claim 1 having the formula III



III

wherein

A denotes a structure having the formula I,

y is 0 or 1,

R<sup>3</sup> denotes a single bond when y=0 and -S-(CH<sub>2</sub>)<sub>2</sub>-[-O-R<sup>2</sup>-]<sub>m</sub>-O- when y=1,

$R^4$  denotes  $-SH$  or  $-S(-CH_2)_2-O-R^5$  when  $y=0$  and  $[-CH_2=CH_2]$   $\underline{-CH=CH_2}$  or  $-$

$(CH_2)_2-S-R^5$  when  $y=1$ ,

$R^5$  denotes  $C_{1-6}$  n-alkyl which is unsubstituted or substituted with at least one  $-OH$  or  $-$

$NHR^7$  group,

$R^7$  denotes H or a  $C_{1-6}$  n-alkyl group,

$z$  is an integer from 3 to 6, and

B denotes a  $z$ -valent residue of a polyfunctionalizing agent.

16. (original) The polythioether of claim 15 wherein  $z=3$ .

17. (original) The polythioether of claim 16 which has an average functionality from about 2.05 to 3.00.

18. (original) The polythioether of claim 15 wherein  $y=0$ .

19. (original) The polythioether of claim 18 wherein  $R^4$  is  $-SH$ .

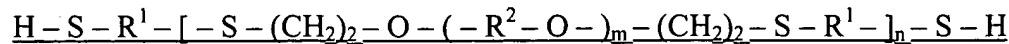
20. (original) The polythioether of claim 18 wherein  $R^4$  is  $-S(-CH_2)_2-O-R^5$ .

21. (original) The polythioether of claim 15 wherein  $y=1$ .

22. (original) The polythioether of claim 21 wherein  $R^4$  is  $-CH=CH_2$ .

23. (original) The polythioether of claim 21 wherein R<sup>4</sup> is -(CH<sub>2</sub>)<sub>2</sub>-S-R<sup>5</sup>.

24. (new) A polythioether comprising:



wherein

R<sup>1</sup> is selected from the group consisting of C<sub>2-6</sub>n-alkylene, and a -[(-CH<sub>2</sub>)<sub>p</sub>-X]<sub>q</sub>-(-CH<sub>2</sub>)<sub>r</sub>- group;

R<sup>2</sup> is selected from the group consisting of C<sub>2-6</sub>n-alkylene, and C<sub>6-8</sub>cycloalkylene;

X is selected from the group consisting of O and S;

m is an integer between 0 and 10;

p is an integer between 2 and 6;

q is an integer between 1 and 5;

r is an integer between 2 and 10; and

n is an integer between 1 and 60 selected so that the molecular weight of the polythioether is between 1,000 and 10,000 Daltons.

25. (new) The polythioether of claim 24 wherein R<sup>1</sup> is C<sub>2-C<sub>6</sub></sub>n-alkylene.

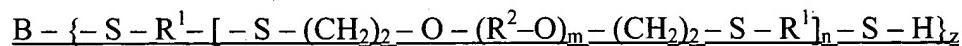
26. (new) The polythioether of claim 24 where R<sup>1</sup> is -[(-CH<sub>2</sub>)<sub>p</sub>-O-]<sub>q</sub>-(-CH<sub>2</sub>)<sub>r</sub>- where r, p, and q are 2.

27. (new) The polythioether of claim 24 wherein R<sup>2</sup> is C<sub>2</sub>-alkyleneoxy.

28. (new)      The polythioether of claim 24 wherein the molecular weight of said polythioether ranges from about 2,000 to about 5,000 Daltons.

29. (new)      The polythioether of claim 24 having an atomic weight percentage ratio of C:S:O of 35-49 : 20-60 : 0-20.

30. (new)      A mixture of polythioether polymers comprising a polythioether polymer having the formula



wherein

$R^1$  is selected from the group consisting of  $C_{2-6}$  n-alkylene, and a  $-[(CH_2)_p - X]_q - (-CH_2)_r -$  group;

$R^2$  is selected from the group consisting of  $C_{2-6}$  n-alkylene, and  $C_{6-8}$  cycloalkylene;

X is selected from the group consisting of O and S;

m is an integer between 0 and 10;

p is an integer between 2 and 6;

q is an integer between 1 and 5;

r is an integer between 2 and 10;

$z$  is an integer from 3 to 6;

B is a  $z$ -valent group of a polyfunctionalizing agent; and

n is an integer between 1 and 60 selected so that the molecular weight of the polythioether is between 1,000 and 10,000 Daltons.